CLAIMS

1. A retardation film, showing birefringence, wherein
the said retardation film comprises a non–liquid crystal polymer,
the non–liquid crystal polymer is aligned,
alignment of the non–liquid crystal polymer on at least one of surfaces of the retardation film is different from alignment of the non–liquid crystal polymer on an inside of the retardation film, and
the surface having the alignment that is different from the alignment on the inside functions as an alignment surface.

2. The retardation film according to claim 1, having a function as an alignment film.

3. The retardation film according to any one of claims 1 and 2, wherein optical characteristics show any of formulae (I) to (III) below,

$nx = ny > nz$ (I)

$nx > ny > nz$ (II)

$nx > ny = nz$ (III),

where, in the above formulae (I) to (III), nx, ny and nz respectively indicate refractive indices in an X–axis direction, a Y–axis direction and a Z–axis direction in the retardation film, the X–axis corresponds to an axial direction exhibiting a maximum refractive index within a plane of the retardation film, the Y–axis corresponds to an axial direction perpendicular to the X–axis within the plane, and the Z–axis corresponds to a thickness direction perpendicular to the X–axis and the Y–axis.

4. The retardation film according to any one of claims 1 to 3, wherein the non–liquid crystal polymer contains at least one polymer selected from the group consisting of polyamide, polyimide, polyester, polyetherketone,

polyaryletherketone, polyamideimide and polyesterimide.

5. The retardation film according to any one of claims 1 to 3, wherein the non–liquid crystal polymer is a polymer of a liquid crystal compound.

6. A method for manufacturing a retardation film, comprising a step of forming an alignment surface by irradiating at least one of surfaces of a polymer film showing birefringence with polarized light so as to change an alignment direction of only the surface of the polymer film that is irradiated with the polarized light.

7. The manufacturing method according to claim 6, wherein the polarized light is linearly polarized light.

8. The manufacturing method according to any one of claims 6 and 7, wherein the polarized light is polarized ultraviolet light.

9. The manufacturing method according to claim 8, wherein the polarized light is polarized ultraviolet light of 200 nm to 400 nm.

10. The manufacturing method according to any one of claims 6 to 9, wherein the polymer film is a film containing a non–liquid crystal polymer.

11. The manufacturing method according to claim 10, wherein the non–liquid crystal polymer is at least one polymer selected from the group consisting of polyamide, polyimide, polyester, polyetherketone, polyaryletherketone, polyamideimide and polyesterimide.

12. The manufacturing method according to any one of claims 10 and 11, further comprising a manufacturing step for manufacturing the polymer

film showing the birefringence by applying a coating solution containing the non–liquid crystal polymer on a surface of a base.

13. The manufacturing method according to claim 12, wherein the obtained polymer film showing the birefringence is further stretched or shrunk in the manufacturing step.

14. The manufacturing method according to claim 13, wherein, in the polymer film showing the birefringence before being stretched or shrunk, a birefringent index (Δn) shown by a formula below is 0.01 or more,

$$\Delta n = nx - nz,$$

where, in the above formula, nx and nz respectively indicate refractive indices in an X–axis direction and a Z–axis direction in the birefringent layer, and the X–axis direction corresponds to an axial direction exhibiting a maximum refractive index within a plane of the birefringent layer, and the Z–axis corresponds to a thickness direction perpendicular to the X–axis.

15. The manufacturing method according to claim 10, wherein the non–liquid crystal polymer is a polymer containing a polymer of a liquid crystal compound.

16. The manufacturing method according to claim 15, further comprising a manufacturing step for manufacturing the polymer film showing the birefringence,

the manufacturing step comprising:

applying a coating solution containing the liquid crystal compound on a surface of an alignment film so as to form a coating film;

subjecting the coating film to a heat treatment so as to align the liquid crystal compound according to an alignment direction of the

alignment film; and then

polymerizing the liquid crystal compound.

17. A retardation film manufactured by the manufacturing method according to any one of claims 6 to 16.

18. The retardation film according to claim 17, having a function as an alignment film.

19. A method for manufacturing a laminated retardation film in which two or more birefringent layers with different alignment directions are laminated,

the method comprising:

preparing the retardation film according to any one of claims 1 to 5, 17 and 18;

applying a coating solution containing a liquid crystal compound on the alignment surface of the retardation film so as to form a coating film; and

subjecting the coating film to a heat treatment for aligning the liquid crystal compound according to an alignment direction of the alignment surface so as to form a birefringent layer.

20. A laminated retardation film manufactured by the manufacturing method according to claim 19.

21. An optical film comprising the retardation film according to any one of claims 1 to 5, 17 and 18, or the laminated retardation film according to claim 20.

22. The optical film according to claim 21, further comprising a

polarizing element.

23. An image display apparatus, comprising the optical film according to any one of claims 21 and 22.

24. The image display apparatus according to claim 23, which is a liquid crystal display.

25. The image display apparatus according to claim 24, which is at least one self–light–emitting image display selected from the group consisting of an electroluminescence (EL) display, an organic electroluminescence (EL) display, a plasma display (PD) and a FED (Field Emission Display).